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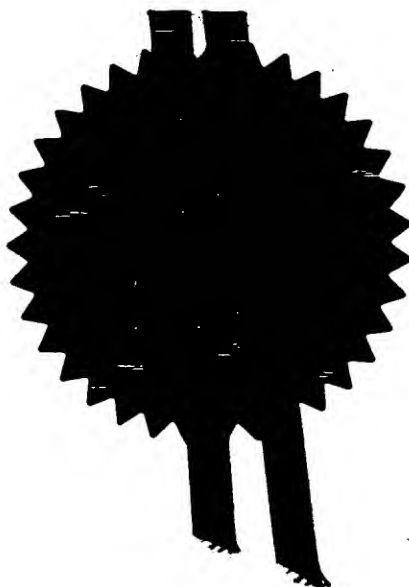
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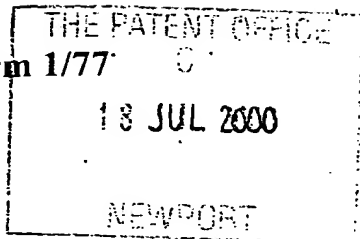
Signed

*Andrew Gersey*

Dated

21 September 2000

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# Request for grant of a patent

(See the notes on the back of this form. You can also get an explanatory leaflet, from the Patent Office to help you fill in this form)

The Patent Office

Cardiff Road  
Newport

Gwent NP9 1RH

1. Your reference DAW47818 JUL 2000

2. Patent application number  
(The Patent Office will fill in this part)

**0017455.7**

3. Full name, address and postcode of the or of each applicant (underline all surnames)

PAMARGAN PRODUCTS LIMITED  
47 Mochdre Enterprise Park  
Newtown  
Powys  
SY16 4LE

Patents ADP number (if you know it)

775461001

If the applicant is a corporate body, give the country/state of its incorporation

GB

4. Title of the invention IMPROVEMENTS IN OR RELATING TO FLUID FILTERS

5. Name of your agent (if you have one)

Barker Brettell

"Address for service" in the United Kingdom to which all correspondence should be sent (including the postcode)

138 Hagley Road  
Edgbaston  
Birmingham  
B16 9PW

Patents ADP number (if you know it)

7442494002

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (if you know it) the or each application number	Country	Priority application number (if you know it)	Date of Filing (day/month/year)

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application	Number of earlier application	Date of filing (day/month/year)

8. Is a statement of inventorship and of right to grant of a patent required in support of this request (Answer 'Yes' if:  
a) any applicant named in part 3 is not an inventor, or  
b) there is an inventor who is not named as an applicant, or  
c) any named applicant is a corporate body.  
See note (d))

YES

# Patents Form 1/77

9. Enter the number of sheets for any of the following items you are filing with this form. Do not count copies of the same document
- Continuation sheets of this form

Description 9 (x2)

Claim(s) -

Abstract -

Drawing(s) 1 (x2)

10. If you are also filing any of the following, state how many against each item.

Priority documents -

Translations of priority documents -

Statement of inventorship and right to grant of a patent (*Patents Form 7/77*) -

Request for preliminary examination (*Patents Form 9/77*) -

Request for substantive examination (*Patents Form 10/77*)

Any other documents  
(please specify)

11. I/We request the grant of a patent on the basis of this application.

Signature *Barker Brettell* Date

**Barker Brettell** 17.07.2000

12. Name and daytime telephone number of person to contact in the United Kingdom
- David Wightman Tel: 0121 456 1364

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## IMPROVEMENTS IN OR RELATING TO FLUID FILTERS

This invention concerns improvements in or relating to fluid filters and in particular to installation of fluid filters in a fluid line. More particularly,  
5 the invention concerns an adaptor for use with the filter described in our co-pending UK patent application No. 9923437.9 filed 5 October 1999.

In our co-pending application we describe a fluid filter with integral seal for a fluid line. The filter may be a mesh screen with the peripheral edge  
10 embedded in the material of the seal. In a preferred application, the combined filter and seal is mounted in an outer support plate which limits the compression applied to the seal when the filter is installed in a fluid line.

15 The present invention seeks to provide an improved arrangement for mounting a filter, preferably the combined filter and seal of our earlier application, in a fluid line, especially an existing fluid line.

More particularly, the present invention aims to provide an arrangement  
20 in which the filter is housed in an adaptor which locates the filter in a desired orientation, preferably transverse, to the fluid line in which the adaptor is installed.

Moreover, it is a desired object of the present invention to provide such  
25 adaptor in which the adaptor is so constructed that fitment and installation of the filter in a fluid line can be effected in a simple and effective manner which preferably also allows access to the filter for cleaning, repair or replacement during routine maintenance and/or in an emergency.

It is yet another preferred object of the present invention to provide a filter assembly including the adaptor in which the filter has an integral seal by means of which a fluid tight seal is obtained in the assembled filter assembly.

5

According to one aspect of the present invention there is provided an adaptor for mounting in a fluid line, the adaptor having first and second threadably engageable parts defining a passageway for flow of fluid through the adaptor wherein the first and second parts have opposed  
10 abutment faces for sealing engagement with the marginal edge of a filter disposed therebetween, and one of the parts is adapted to locate the filter transverse to the passageway.

Preferably, the filter is of the type described in our co-pending  
15 application and comprises a mesh screen with an integral seal embedded in the marginal edge of the screen that contacts the opposed abutment faces on each side of the filter.

Advantageously, the filter is supported in a recess in one of the parts by  
20 means of which the filter is located transverse to the passageway. In a preferred embodiment, the filter with integral seal is mounted in a support member which seats in the recess.

Preferably, the depth of the recess is less than the thickness of the  
25 support member so that the support member projects from the recess and is clamped between the abutment faces in the assembled adaptor.

Advantageously, the first and second parts are provided with complementary internal and external screw threads on a socket portion of  
30 a female fitting and a plug portion of a male fitting.

Preferably, the recess for locating the filter is provided in the plug portion of the male fitting for pre-assembly of the filter on the male fitting prior to engagement of the plug portion with the socket portion of the female fitting.

5

Advantageously, both parts are provided with a non-circular, preferably hexagonal, body portion for engagement by a spanner or similar tool to assist relative rotation of the parts during assembly of the adaptor.

- 10 According to another aspect of the present invention, there is provided a filter assembly including an adaptor for connecting the assembly in a fluid line, the adaptor having first and second parts releasably connectable to define a passageway for flow of fluid through the adaptor, a filter arranged to extend across the passageway between opposed abutment
- 15 surfaces of the first and second parts, one of the parts having a recess for locating the filter, and a seal integral with a marginal edge of the filter, the seal being arranged to contact the abutment faces on each side of the filter and being compressed therebetween when the first and second parts are connected to seal the filter in the adaptor.

20

Preferably, the first and second parts have co-operating screw threads arranged for relative axial movement of the first and second parts to urge the abutment faces axially towards each other to compress the seal therebetween.

25

Advantageously, one of the abutment faces is provided by the recess in which the filter is located and retained in the assembled adaptor so that the filter is positioned transverse to the passageway.

Preferably, the filter and seal are mounted in a support member which is received in the recess and limits the compression of the seal between the abutment faces.

- 5 Advantageously, the support member projects from the recess and is clamped between the abutment faces in the assembled adaptor.

Other features, benefits and advantages of the invention will be apparent from the description later herein of exemplary embodiments.

10

The invention will now be described in more detail, by way of example only, with reference to the accompanying drawings wherein:-

- 15 **Figure 1** is an exploded longitudinal sectional view of the adaptor according to the invention;

**Figure 2** is a longitudinal sectional view of the assembled adaptor; and

- 20 **Figure 3** is an end view of the adaptor.

Referring to the drawings, there is shown an assembly 1 for installing a filter 2 in a fluid line (not shown). The assembly 1 includes an adaptor 3 housing the filter 2 and connectable in the fluid line.

25

The filter 2 comprises an annular mesh screen of metal or plastics with an integral seal 4 of elastomeric material embedded in the peripheral edge of the mesh screen. The size or rating of the mesh depends on the nature of the fluid medium to be filtered and is chosen accordingly to remove solid particles above a given size.

30



The filter 2 and seal 4 are mounted in an annular support plate 5 having a stepped hole 6 providing an internal shoulder 7 for locating the peripheral edge of the filter 3. The elastomeric material of the seal 4 is bonded to the marginal edge of the hole 6 and has taper sealing faces 4a, 4b  
5 extending from the plate 5 on each side.

The filter 2 with integral seal 4 forms the subject matter of our co-  
pending UK patent application No.9923437.9 the disclosure of which is  
incorporated herein by reference and to which the reader is directed for a  
10 further description and explanation of the details thereof.

The adaptor 3 comprises first and second parts 8, 9 arranged to be  
threadably engaged to locate and retain the filter 2 therebetween as  
described later.  
15

The first part 8 has a hexagonal body portion 10 at one end for  
engagement by a spanner or like tool to rotate the body portion 10 during  
assembly and an annular spigot portion 11 at the other end.

20 The spigot portion 11 has an external screw thread 12 for threaded  
engagement with a complementary threaded internal bore (not shown) of  
the fluid line on which the adaptor 3 is installed. Alternatively, the  
spigot portion 11 may have an internal screw thread for engagement with  
an external screw thread of the fluid line. The screw thread 12 terminates  
25 on an external shoulder 13.

For some applications, the shoulder 13 may provide a stop face to limit  
threaded engagement of the spigot portion 11 in the bore of the fluid line.  
In this case, the shoulder 13 may be provided with a seal (not shown).  
30

The spigot portion 11 is formed with a cylindrical bore 14 corresponding to the bore of the fluid line and opening to an enlarged counterbore 15 defining a socket 16 in the body portion 9.

- 5 The counterbore 15 is formed with an internal screw thread 17 terminating in an internal shoulder providing an abutment face 18 for the taper sealing face 4a of the seal 4 on one side of the filter 2.

The second part 9 has a hexagonal body portion 19 intermediate the ends  
10 for engagement by a spanner or like tool to rotate the body portion 19 during assembly.

An annular spigot portion 20 similar to the spigot portion 11 of the first part 8 is provided at one end and has an external screw thread 21 for  
15 threaded engagement with a complementary threaded bore (not shown) of the fluid line in which the adaptor 3 is installed. Alternatively, the spigot portion 20 may have an internal screw thread for engagement with an external screw thread of the fluid line. The screw thread 21 terminates in an external shoulder 22. In some applications, the shoulder 22 may  
20 provide a stop face to limit threaded engagement of the spigot portion 20 in the bore of the fluid line. In this case, the shoulder 22 may be provided with a seal (not shown).

A further annular spigot portion 23 is provided at the other end defining a  
25 male plug 24 with an external screw thread 25 complementary to the internal screw thread 17 of the counterbore 15 defining the female socket 16 in the first part 8.

The second part 9 has a cylindrical through bore 26 matching the bore 14  
30 in the first part 8 and corresponding to the bore of the fluid line. The bores 14, 26 define a fluid passageway through the assembled adaptor 3.

The spigot portion 23 is formed with an annular countersink 27 in the end face sized to receive the support member 5 to locate the filter 2 transverse to the passageway. The countersink 27 provides an abutment face 28 for the taper sealing face 4b of the seal 4 on the other side of the filter 2.

The diameter of the countersink 27 is slightly larger than the diameter of the support member 5 and the depth of the countersink 27 is slightly smaller than the thickness of the support member 5. In this way, the support member 5 is a close fit in the countersink 27 and projects from the countersink 27.

Use of the adaptor 3 to install the filter 2 in a fluid line will now be described. The filter 2 is first mounted on the second part 9 by positioning the support member 5 in the countersink 27 at the end of the spigot portion 23. The taper sealing face 4b of the seal contacts the abutment face 28 and the support member 5 projects from the countersink 27.

The external thread 24 of the spigot portion 23 is then screwed into engagement with the internal thread 17 of the counterbore 15 in the first part 8. On initial tightening, the parts 8, 9 are brought together axially so that the sealing taper face 4a of the seal 4 contacts the opposed abutment face 18 of the first part 8.

On further tightening, the taper seal faces 4a, 4b are compressed due to the axial forces applied and the support member 5 is urged into the countersink 27 until the seal 4 is substantially flush with the support member 5.

30

In this condition, the support member 5 projects slightly from the countersink 27 and is firmly clamped between the abutment faces 18, 28 with the taper sealing faces 4a, 4b compressed against the abutment faces 18, 28 to seal completely the filter 2 in the adaptor 3. In this way, the filter 2 is positioned transverse to the fluid passageway and is sealed on both sides to prevent leakage of fluid.

As will now be understood, the adaptor 3 ensures accurate location and facilitates installation of the filter 2 in a fluid line transverse to the direction of fluid flow in a simple and effective manner that also facilitates access to the filter 2 for cleaning, repair or replacement during routine maintenance and/or in an emergency.

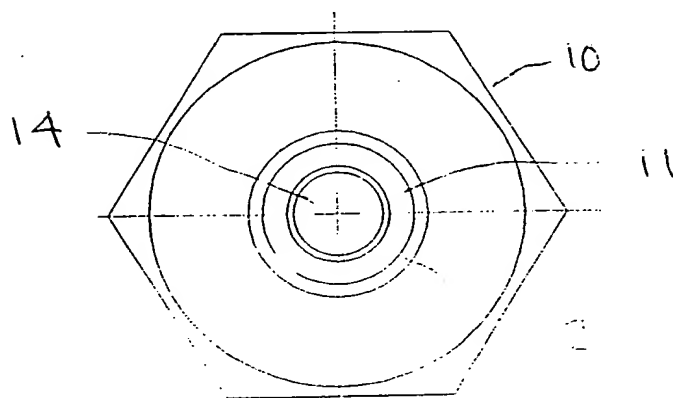
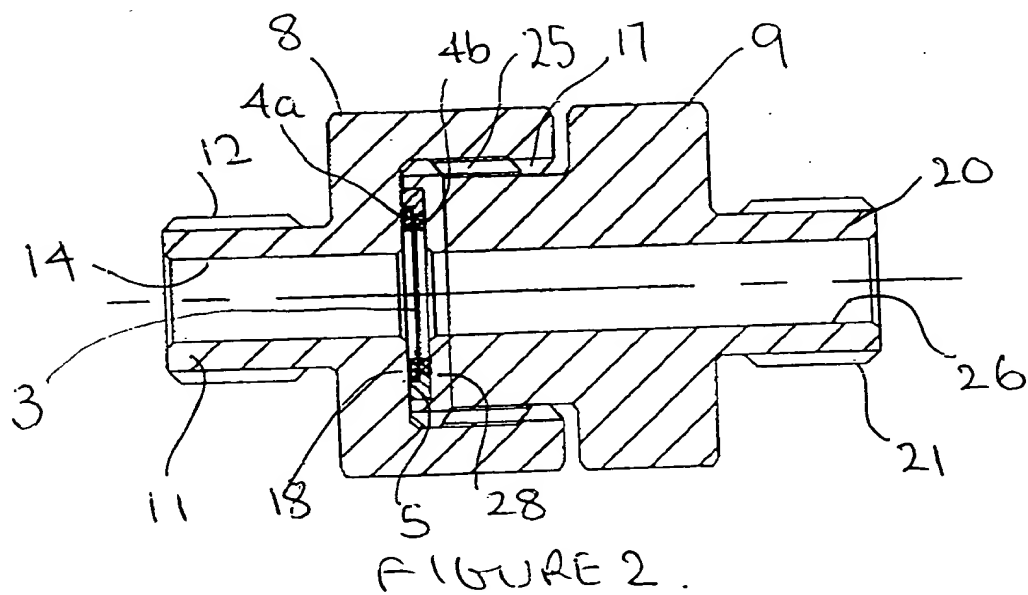
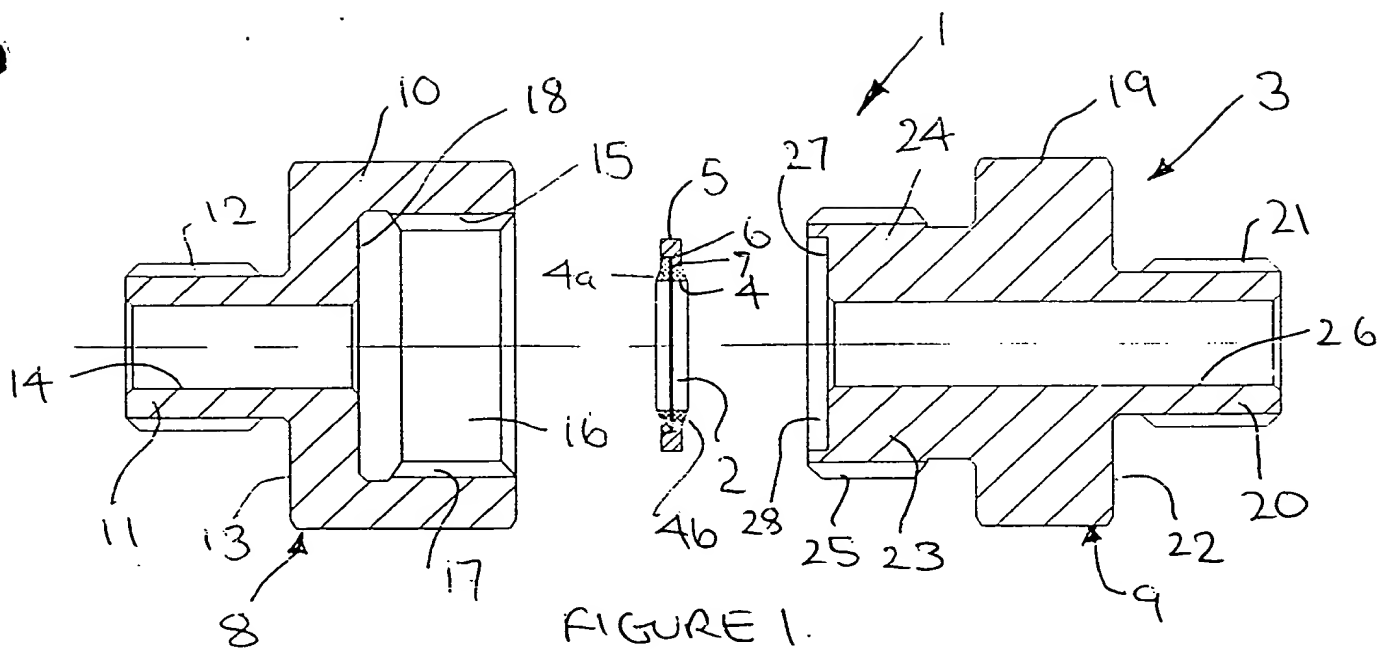
In the above-described embodiment, the support member 5 limits compression of the seal 4 in the assembled adaptor 3. It will be understood, however, that the support member 5 may be omitted and the filter 2 with integral seal 4 mounted in the countersink 27 so that compression of the seal 4 is controlled by engagement of the parts 8, 9.

It will be appreciated that the invention is not limited to the embodiment above-described. For example, the countersink 27 for locating the filter 2 could be provided in the socket 16. The first and second parts may be releasably connectable together by any suitable means for urging the opposed abutment faces 18, 28 axially to locate and retain the filter 2 therebetween. The threaded spigots 11, 20 at each end of the adaptor 3 may be of any size with internal or external threads of any type compatible with the fluid line in which the adaptor 3 is to be fitted. Similarly, the size of the passageway may be chosen to suit the fluid line with the filter 2 also sized accordingly. Other modifications will be apparent to those skilled in the art.

Finally, while the invention has particular application for installing a filter with integral seal, it will be understood that the benefits and advantages described herein may be obtained with other types of filter.

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